

A Case of Percutaneous Intramedullary Fixation of Metacarpal Fracture Using Headless Compression Screw (HCS)

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INTRODUCTION:

Metacarpal shaft fractures typically present as transverse, oblique or comminuted patterns¹. The goals of treatment are to achieve acceptable alignment, stable reduction, strong bony union and unrestricted motion¹. Although closed reduction may be attempted for displaced transverse metacarpal shaft fractures, operative fixation is required in pseudoclaving, rotational deformity, significant shortening or prominent dorsal deformity¹. Many fixation techniques can be used including wiring and plating². However, loss of reduction, mal-union, joint stiffness and surgical site infection have been reported post-operatively. We aim to evaluate percutaneous intramedullary fixation of metacarpal fractures using HCS as an alternative fixation technique.

MATERIALS & METHODS:

Our patient has transverse fracture midshaft of fifth metacarpal where displacement and rotation of fracture were noted following non-operative treatment (Fig 1). The proximal phalanx was maximally flexed to expose the head of metacarpal. A 5mm vertical incision was made and the extensor tendon split longitudinally at midline. Closed manual reduction was performed to obtain acceptable reduction. Under fluoroscopic guidance, we inserted a 1.0-mm guidewire along the longitudinal axis of the metacarpal (Fig 2). Only the subchondral bone plate was countersunk with cannulated countersink². A 3.5-mm HCS is inserted over the guidewire (Fig 2). The trailing threads of the screw were completely buried below the cartilage line (Fig 4)².



Figure 1: Plain radiograph of displaced fracture of right 5th metacarpal bone.



Figure 2: Single axial guidewire inserted into intramedullary canal.



Figure 3: Final placement of headless compression screw.

RESULTS:

The duration of operation was 10 minutes. Reduction was achieved and maintained with a single headless compression screw. We found this method of fixation less technical than cross K-wiring and less invasive than plating. The patient began moving her joint the next day. She was also satisfied with the small scar. At 6 weeks, she demonstrated full range of motion of her 5th metacarpophalangeal joint.

DISCUSSIONS:

Percutaneous intramedullary fixation of metacarpal fractures using HCS was first introduced by Boulton et al.³ Hand surgeons who have used this technique have found it less invasive where only a small incision is needed to enable insertion of screw. As such, this avoids stripping of periosteum, which allowed minimal devascularization and reduces risk of surgical site infection². It is also a relatively stable fixation hence immobilisation is not required post-operatively and patient is able to begin motion of joints.

CONCLUSION:

Percutaneous intramedullary fixation of metacarpal fractures using HCS can be an alternative fixation technique for displaced transverse metacarpal shaft fractures.

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